

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Fire Retardant Resins**with type designation(s)
ETERSET 2929 Series

Issued to

Eternal Materials Co., Ltd.
Kaohsiung, Taiwan

is found to comply with

DNV GL class programme DNVGL-CP-0083 – Type approval – Polyester resin, vinylester resin, gelcoat and topcoat**Det Norske Veritas' Standards for Certification No. 2.20, Lifeboats and Rescue Boats, 2007****Application :****Fire retardant resin for use in marine vessels according to stated Rules/Standards.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**This Certificate is valid until **2021-09-07**.Issued at **Høvik** on **2016-09-08**DNV GL local station: **Kaohsiung**Approval Engineer: **Stefan Marion**for **DNV GL**

Martin Strande
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

ETERSET 2929 Series; Low halogenated, flame retardant unsaturated polyester resin

Variants, with promoter:
ETERSET 2929P, ETERSET 2929PT

Variants, without promoter:
ETERSET 2929, ETERSET 2929-F

The following properties have been verified by Type Testing of cured resin samples:

Properties	Test Method	Results		
Tensile Strength	ISO 527	85.0	MPa	mean
Fracture Elongation	ISO 527	3.27	%	mean
Water Absorption	ISO 62	21.7	mg	mean
HDT	ISO 75	74.3	°C	mean
Barcol Hardness	ASTM D2583	40	-	mean
Density		1.297	g/cm ³	mean
Oxygen Index, cured resin	ASTM D2863	26	-	
Oxygen Index, laminate	ASTM D2863	37	-	
Fire retardant	ISO 5660-1. LSA code, MSC/Circ.1006	Pass	-	
Curing procedure used for Type Testing		24 hrs at room temperature, 24 hrs at 50°C		

Legend:

mean = Mean of Type Test results

Type Approval documentation

- 1.
- 2.
- 3.
- 4.

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**

Marking of product

Product shall be marked with *manufacturer's name*, **Eternal Materials Co. Ltd., Taiwan** and *type designation*.

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV GL Type Approval Certificate.

Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical Assessment to be performed after two (2) years (Certificate Retention) and at renewal after five (5) years (Certificate Renewal).



Job Id: **262.1-021934-1**
Certificate No: **TAK00000G2**

The main elements of the Periodical Assessment are to:

- Ensure that Type Approval documentation is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with Type Approval documentation and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV GL Type Approval Certificate.

END OF CERTIFICATE